Inventor Search

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L9 ANSWER 1 OF 7 HCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2004:397248 HCAPLUS
TITLE: Reduced calcification of bioprostheses, cross-linked via an improved carbodiimide based method
AUTHOR(S): **Everaerts, Frank; Torrianni, Mark;** van Luyn, Marja; van Wachem, Pauline; Feijen, Jan; Hendriks, Mark
CORPORATE SOURCE: Biomaterials S&T, Medtronic Bakken Research Center, Maastricht, 6229 GW, Neth.
SOURCE: Biomaterials (2004), 25(24), 5523-5530
CODEN: BIMADU; ISSN: 0142-9612
PUBLISHER: Elsevier Science Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Glutaraldehyde fixation of bioprosthetic tissue has been used successfully for almost 40 yr. However, it is generally recognized that glutaraldehyde fixation of bioprostheses is associated with the occurrence of calcification. Accordingly, many efforts have been undertaken to develop techniques for the fixation of bioprostheses, which will not lead to calcification. Here we describe a new improved carbodiimide based **crosslinking** method. Rather than **crosslinking** the tissue through its free primary amine groups, these groups were first blocked with butanal and the tissue was then cross-linked by means of carbodiimide activation of tissue carboxylic acid groups followed by a reaction with a poly(propylene glycol)bis 2-(aminopropyl) ether, (Jeffamine). It was demonstrated that cross-linked porcine leaflets had a calcification of less than 1 mg/g tissue after 8 wk sub-dermal implantion in rats. Furthermore, aortic wall calcification was reduced to 50 mg/g, compared to standard glutaraldehyde fixed tissue, which showed 120 mg/g tissue calcification in the 8 wk calcification model used.
CC 63-7 (Pharmaceuticals)
ST carbodiimide heart valve bioprosthetic
IT Calcification
Crosslinking
(reduced calcification of bioprostheses, cross-linked via an improved carbodiimide based method)
IT Heart
(valve, bioprosthetic; reduced calcification of bioprostheses, cross-linked via an improved carbodiimide based method)
IT 7440-70-2, Calcium 7723-14-0, Phosphorus
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(reduced calcification of bioprostheses, cross-linked via an improved carbodiimide based method)
IT 123-72-8, Butanal
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(reduced calcification of bioprostheses, cross-linked via an improved carbodiimide based method)
IT 9046-10-0, Jeffamine 400
RL: PRP (Properties); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(reduced calcification of bioprostheses, cross-linked via an improved carbodiimide based method)
IT 1892-57-5, 1-Ethyl-3-(3-dimethylaminopropyl)carbodiimide 6066-82-6, N-Hydroxysuccinimide
RL: RCT (Reactant); RACT (Reactant or reagent)
(reduced calcification of bioprostheses, cross-linked via an improved carbodiimide based method)

REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L9 ANSWER 2 OF 7 HCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2003:950040 HCAPLUS
DOCUMENT NUMBER: 140:19764
TITLE: Methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells
INVENTOR(S): **Mckay, William F.**; Boden, Scott D.; Yoon, Sangwook T.
PATENT ASSIGNEE(S): USA
SOURCE: U.S. Pat. Appl. Publ., 81 pp., Cont.-in-part of U.S. Ser. No. 292,951.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
US 2003225021	A1	20031204	US 2003-382844		20030307
US 2003180266	A1	20030925	US 2002-292951		20021113
PRIORITY APPLN. INFO.:			US 2001-331321P	P	20011114
			US 2002-292951	A2	20021113
			US 1988-124238	A	19880729
			US 2000-959578	A	20000428

AB A method of inducing the expression of one or more **bone** morphogenetic proteins and/or transforming growth factor-β proteins in a cell is described. The method includes transfecting a cell with an isolated nucleic acid comprising a nucleotide sequence encoding a LIM mineralization protein operably linked to a promoter. The one or more **bone** morphogenetic proteins can be BMP-2, BMP-4, BMP-6, BMP-7 or combinations thereof. The transforming growth factor-β protein can be transforming growth factor-β1 protein (TGF-β1). Transfection may be accomplished ex vivo or in vivo by direct injection of virus or naked DNA, or by a nonviral vector such as a plasmid. The method can be used to induce **bone** formation in osseous cells or to stimulate proteoglycan and/or **collagen** production in cells capable of producing proteoglycyan and/or **collagen** (e.g., intervertebral disk cells).

IC ICM A61K048-00
ICS C12N005-08; C12N015-861; C12N015-867
NCL 514044000; 424093200; 435456000; 435366000
CC 63-1 (Pharmaceuticals)
Section cross-reference(s): 3, 6, 14
ST **bone** morphogenetic protein transforming growth factor gene therapy; BMP TGF gene **bone** formation intervertebral disk disease; oligonucleotide transformation cell implant **bone** disease
IT **Bone** morphogenetic proteins
RL: BSU (Biological study, unclassified); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(2; methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)
IT **Bone** morphogenetic proteins
RL: BSU (Biological study, unclassified); THU (Therapeutic use); BIOL (Biological study); USES (Uses)

(4; methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)

IT **Bone** morphogenetic proteins
RL: BSU (Biological study, unclassified); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(6; methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)

IT **Bone** morphogenetic proteins
RL: BSU (Biological study, unclassified); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(7; methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)

IT Adenoviridae
(AdLMP-1; methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)

IT Gene, animal
RL: BSU (Biological study, unclassified); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(BMP-2; methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)

IT Gene, animal
RL: BSU (Biological study, unclassified); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(BMP-4; methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)

IT Gene, animal
RL: BSU (Biological study, unclassified); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(BMP-6; methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)

IT Gene, animal
RL: BSU (Biological study, unclassified); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(BMP-7; methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)

IT Proteins
RL: BSU (Biological study, unclassified); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(HLMP-1; methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)

IT Proteins
RL: BSU (Biological study, unclassified); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(HLMP-1s; methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)

IT Proteins
RL: BSU (Biological study, unclassified); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(HLMP-2; methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta

proteins (TGF-βs) in cells)
IT Proteins
RL: BSU (Biological study, unclassified); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(HLMP-3; methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)
IT Proteins
RL: BSU (Biological study, unclassified); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(LIM domain-containing; methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)
IT Proteins
RL: BSU (Biological study, unclassified); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(LMP-1; methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)
IT Proteins
RL: BSU (Biological study, unclassified); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(RLMP; methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)
IT Gene, animal
RL: BSU (Biological study, unclassified); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(TGF-β1; methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)
IT Cell
(annulus fibrosus; methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)
IT Spinal column, disease
(intervertebral disk hernia; methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)
IT Spinal column
(intervertebral disk; methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)
IT Stem cell
(mesenchymal; methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)
IT Adenoviral vectors
Bone formation
Gene therapy
Genetic vectors
Hematopoietic precursor cell
Mammalia
Mesenchyme
Molecular cloning
Nucleic acid hybridization
Ore genesis
Plasmid vectors
Retroviral vectors
Retroviridae

Transformation, genetic
Transplant and Transplantation
Viral vectors
Virus
(methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)

IT Oligonucleotides
RL: BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study)
(methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)

IT **Bone** morphogenetic proteins
RL: BSU (Biological study, unclassified); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)

IT Nucleic acids
RL: BSU (Biological study, unclassified); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)

IT Promoter (genetic element)
RL: BSU (Biological study, unclassified); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)

IT Cytomegalovirus
(promoter; methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)

IT Cell nucleus
(pulposus; methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)

IT Animal cell
(somatic; methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)

IT Transforming growth factors
RL: BSU (Biological study, unclassified); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(β-; methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)

IT 630143-01-0 630143-02-1
RL: PRP (Properties); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(oligonucleotide; methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)

IT 630150-76-4 630150-77-5 630150-78-6 630150-79-7 630150-80-0
630150-81-1 630150-82-2 630150-83-3 630150-85-5 630150-86-6
630150-87-7 630150-88-8 630150-89-9 630150-90-2 630150-91-3
630150-92-4 630150-93-5 630150-94-6 630150-95-7 630150-96-8
630150-97-9 630150-98-0 630150-99-1 630151-00-7 630151-01-8

630151-02-9 630151-03-0 630151-04-1 630151-06-3 630151-07-4
630151-08-5 630151-10-9 630151-12-1 630151-13-2
RL: PRP (Properties)
(unclaimed nucleotide sequence; methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)

IT 630150-75-3 630150-84-4 630151-05-2 630151-09-6 630151-11-0
RL: PRP (Properties)
(unclaimed protein sequence; methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)

IT 630151-14-3 630151-15-4 630151-16-5 630151-17-6 630151-18-7
630151-19-8 630151-20-1 630151-21-2 630151-22-3
RL: PRP (Properties)
(unclaimed sequence; methods of inducing the expression of **bone** morphogenetic proteins (BMPs) and transforming growth factor-beta proteins (TGF-βs) in cells)

L9 ANSWER 3 OF 7 HCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2003:397004 HCAPLUS
DOCUMENT NUMBER: 138:397329
TITLE: cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury
INVENTOR(S): **McKay, William F.**; Boden, Scott D.; Yoon, Sangwook T.
PATENT ASSIGNEE(S): Medtronic Sofamor Danek, USA
SOURCE: PCT Int. Appl., 94 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
WO 2003042368	A2	20030522	WO 2002-US36465		20021114
WO 2003042368	A3	20031016			
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM					
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG					
US 2003180266	A1	20030925	US 2002-292951		20021113
PRIORITY APPLN. INFO.:			US 2001-331321P	P	20011114
			US 2002-292951	A	20021113
			US 1988-124238	A	19880729
			US 2000-959578	A	20000428

AB Methods of expressing LIM mineralization protein in non-osseous mammalian cells, such as stem cells or intervertebral disk cells (e.g., cells of the annulus fibrosus, or cells of the nucleus pulposus) are described. The methods involve transfecting the cells with an isolated nucleic acid comprising a nucleotide sequence encoding a LIM mineralization protein operably linked to a promoter. Transfection may be accomplished ex vivo

or in vivo by direct injection of virus or naked DNA, or by a nonviral vector such as a plasmid. Expression of the LIM mineralization protein can stimulate proteoglycan and/or **collagen** production in cells capable of producing proteoglycan and/or **collagen.** Methods for treating disk disease associated with trauma or disk degeneration are also described.

IC ICM C12N

CC 3-3 (Biochemical Genetics)
Section cross-reference(s): 1, 6, 13

ST cDNA LIM mineralization protein human rat sequence; disk degeneration injury therapy LMP protein splicing isoform

IT **Bone** morphogenetic proteins
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(2, LMP protein in stimulating synthesis of; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)

IT Adenoviral vectors
(AdHLMP-1, LIM mineralization protein cDNA cloning in; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)

IT Protein motifs
(LIM domain, in LMP proteins; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)

IT Plasmid vectors
Retroviral vectors
Viral vectors
(LIM mineralization protein cDNA cloning in; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)

IT Proteoglycans, biological studies
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(LIM mineralization protein in stimulating synthesis of; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)

IT mRNA
RL: ANT (Analyte); BSU (Biological study, unclassified); ANST (Analytical study); BIOL (Biological study)
(LIM mineralization protein; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)

IT cDNA
RL: BSU (Biological study, unclassified); PRP (Properties); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(LIM mineralization protein; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)

IT Proteins
RL: BSU (Biological study, unclassified); PRP (Properties); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(LMP (LIM mineralization protein), isoforms 1,2 and 3, of rat and human; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)

IT **Bone** morphogenetic proteins
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(LMP protein in inducing synthesis of; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)

IT Osteocalcins
RL: BSU (Biological study, unclassified); BIOL (Biological study)

(LMP protein in stimulating secretion of; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)

IT **Collagens**, biological studies
RL: BSU (Biological study, unclassified); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(LMP protein in stimulating synthesis of, as carrier for LMP protein implant in vertebral disk; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)

IT Aggrecans
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(LMP protein in stimulating synthesis of; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)

IT **Bone** formation
(LMP protein in; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)

IT RNA splicing
(LMP protein mRNA; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)

IT Body, anatomical
(back, disease, pain, lower; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)

IT Pain
(back, lower; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)

IT Animal cell
Gene therapy
Human
Mammalia
Nucleic acid hybridization
Rattus
(cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)

IT Promoter (genetic element)
RL: BSU (Biological study, unclassified); BUU (Biological use, unclassified); BIOL (Biological study); USES (Uses)
(cytomegalovirus, for LMP proteins synthesis; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)

IT **Bone**, disease
(degenerative disk disease, spine stenosis; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)

IT Probes (nucleic acid)
RL: ARG (Analytical reagent use); BUU (Biological use, unclassified); ANST (Analytical study); BIOL (Biological study); USES (Uses)
(for LMP protein cDNA; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)

IT Primers (nucleic acid)
RL: ARG (Analytical reagent use); BUU (Biological use, unclassified); PRP (Properties); ANST (Analytical study); BIOL (Biological study); USES (Uses)
(for LMP protein cDNA; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk

injury)
IT cDNA sequences
(for LMP proteins of human and rat; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)
IT Drug delivery systems
(implants, LMP protein in; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)
IT Drug delivery systems
(injections, LMP protein in; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)
IT Spinal column, disease
(intervertebral disk hernia; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)
IT Spinal column
(intervertebral disk; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)
IT Spinal cord
(lumbar, fusion, LMP protein in gene therapy in; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)
IT **Bone** formation
(mineralization, LMP protein in; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)
IT Molecular cloning
(of LIM mineralization proteins; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)
IT Protein sequences
(of LMP proteins of human and rat; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)
IT Cell differentiation
(osteoblast, LMP protein in; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)
IT Stem cell
(pluripotent, LIM mineralization protein mRNA in; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)
IT Cytomegalovirus
(promoter for LMP proteins synthesis; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)
IT Mutation
(splice site, LMP protein; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)
IT Glycosaminoglycans, biological studies
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(sulfated, LMP protein in inducing synthesis of; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)
IT Polymers, biological studies
RL: DEV (Device component use); THU (Therapeutic use); BIOL (Biological

study); USES (Uses)
(synthetic, as carrier for LMP protein containing cell used in intervertebral disk implant; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)

IT Spinal column
(vertebra, annulus fibrosus, nucleus pulposus, LIM mineralization protein mRNA in; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)

IT 530167-58-9 530167-59-0 530167-62-5 530167-64-7
RL: BSU (Biological study, unclassified); PRP (Properties); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(amino acid sequence; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)

IT 256606-43-6, GenBank AC023788
RL: BSU (Biological study, unclassified); PRP (Properties); BIOL (Biological study)
(cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)

IT 530167-57-8 530167-60-3 530167-61-4 530167-63-6
RL: BSU (Biological study, unclassified); PRP (Properties); THU (Therapeutic use); BIOL (Biological study); USES (Uses)
(nucleotide sequence; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)

IT 530167-30-7 530167-31-8
RL: ARG (Analytical reagent use); BUU (Biological use, unclassified); PRP (Properties); ANST (Analytical study); BIOL (Biological study); USES (Uses)
(primer sequence; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)

IT 530170-01-5, 3: PN: WO03042368 SEQID: 3 unclaimed DNA 530170-02-6
530170-03-7 530170-04-8, 6: PN: WO03042368 SEQID: 6 unclaimed DNA
530170-05-9, 7: PN: WO03042368 SEQID: 7 unclaimed DNA 530170-06-0, 8: PN: WO03042368 SEQID: 8 unclaimed DNA 530170-07-1 530170-08-2
530170-09-3 530170-10-6 530170-11-7 530170-12-8 530170-13-9
530170-14-0 530170-15-1 530170-16-2 530170-17-3 530170-18-4
530170-19-5 530170-20-8 530170-21-9 530170-22-0 530170-23-1
530170-24-2 530170-25-3 530170-26-4 530170-28-6 530170-29-7
530170-30-0 530170-31-1 530170-33-3 530170-34-4 530170-35-5
530170-36-6 530170-37-7 530170-38-8 530170-39-9 530170-40-2
RL: PRP (Properties)
(unclaimed nucleotide sequence; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)

IT 530170-27-5
RL: PRP (Properties)
(unclaimed protein sequence; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)

IT 530158-96-4
RL: PRP (Properties)
(unclaimed sequence; cDNAs encoding rat and human LIM mineralization proteins and their use in treatment of disk degeneration and disk injury)

L9 ANSWER 4 OF 7 HCAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2002:181215 HCAPLUS
DOCUMENT NUMBER: 137:358009
TITLE: Optimization of diamine bridges in glutaraldehyde treated bioprosthetic aortic wall tissue
AUTHOR(S): Human, Paul; Bezuidenhout, Deon; **Torrianni, Mark**; Hendriks, Marc; Zilla, Peter
CORPORATE SOURCE: Cape Heart Centre, Department of Cardiothoracic Surgery, University of Cape Town, Cape Town, S. Afr.
SOURCE: Biomaterials (2002), 23(10), 2099-2103
CODEN: BIMADU; ISSN: 0142-9612
PUBLISHER: Elsevier Science Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Objective: Bioprosthetic calcification can be significantly mitigated by both increased concns. of glutaraldehyde (GA) and the introduction of diamine (DA) bridges. The purpose of the present study was to evaluate whether an optimal effect of DA-enhanced fixation can be achieved by titration of dialdehyde and diamine concns. Methods: Porcine aortic roots were fixed at 0.05% GA (under-fixation) or 0.2% GA and 0.7% GA (com. fixation). An interim step of DA treatment (l-Lysine; 0, 25, 50 or 100 mm; 37°C; 2 days) was followed by completion of the GA fixation (37°C; 5 days). Aortic wall coupons (12 mm) were punched out and implanted s.c. into seven-week old Long-Evans rats for 60 days. Calcium content was assessed by atomic absorption spectroscopy and histol. Results: Increasing the l-Lysine concns. beyond 25 mm was essential to achieve the anti-calcific effect of DA-enhanced fixation. This effect was proportional to the GA concns. applied. Compared to non-enhanced GA fixation (0 mm DA), calcification increased by 17.4% ($p=0.2114$) in 0.05% fixed tissue but decreased by 32.0% ($p<0.0001$) and 45.1% ($p<0.0002$) in 0.2% and 0.7% GA, resp., when the DA concentration was 100 mm. Histol. the extent, but not the pattern of calcification, was affected. Conclusion: The calcium mitigating effect of diamine-treatment as an interim step of glutaraldehyde fixation is proportional to the GA concentration applied. Within com. 0.7% GA fixation 100 mm DA has the potential to practically halve aortic wall calcification.
CC 63-7 (Pharmaceuticals)
ST aorta glutaraldehyde **crosslinking** calcification
IT Artery
(aorta; optimization of diamine bridges in glutaraldehyde treated bioprosthetic aortic wall tissue)
IT Prosthetic materials and Prosthetics
(bioprosthetics; optimization of diamine bridges in glutaraldehyde treated bioprosthetic aortic wall tissue)
IT Amines, formation (nonpreparative)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(diamines; optimization of diamine bridges in glutaraldehyde treated bioprosthetic aortic wall tissue)
IT Calcification
Crosslinking
(optimization of diamine bridges in glutaraldehyde treated bioprosthetic aortic wall tissue)
IT Heart
(valve, bioprosthetic; optimization of diamine bridges in glutaraldehyde treated bioprosthetic aortic wall tissue)
IT 56-87-1, L-Lysine, biological studies
RL: BSU (Biological study, unclassified); BIOL (Biological study)
(optimization of diamine bridges in glutaraldehyde treated bioprosthetic aortic wall tissue)
IT 111-30-8, Glutaraldehyde

RL: MOA (Modifier or additive use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(optimization of diamine bridges in glutaraldehyde treated bioprosthetic aortic wall tissue)
REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L9 ANSWER 5 OF 7 HCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2000:553459 HCAPLUS
DOCUMENT NUMBER: 133:155511
TITLE: Highly-mineralized osteogenic sponge compositions, and uses thereof
INVENTOR(S): **McKay, William F.**
PATENT ASSIGNEE(S): SDGI Holdings, Inc., USA
SOURCE: PCT Int. Appl., 34 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2000045871	A1	20000810	WO 2000-US3043	20000204
W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
EP 1150726	A1	20011107	EP 2000-905989	20000204
EP 1150726	B1	20031105		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2002536077	T2	20021029	JP 2000-596990	20000204
AT 253385	E	20031115	AT 2000-905989	20000204
AU 772682	B2	20040506	AU 2000-27568	20000204
ES 2209820	T3	20040701	ES 2000-905989	20000204
PRIORITY APPLN. INFO.:			US 1999-118615P P	19990204
			WO 2000-US3043 W	20000204

AB Osteogenic sponge compns. having enhanced osteoinductive properties for use in **bone** repair are described. The compns. include a quickly resorbable porous carrier, a more slowly resorbed mineral scaffold and an osteogenic factor, preferably a **bone** morphogenetic protein. The compns. enable increased osteoinductive activity while retaining a reliable scaffold for the formation of new **bone** at an implant site. Methods for therapeutic use of the compns. are also described.
IC ICM A61L027-22
ICS A61L027-56; A61L027-46; A61K038-18
CC 63-7 (Pharmaceuticals)
Section cross-reference(s): 2
ST osteogenic sponge morphogenetic protein **bone** implant
IT **Bone** morphogenetic proteins
RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); DEV (Device component use); PEP (Physical, engineering or chemical process); THU (Therapeutic use); BIOL (Biological study); PROC (Process); USES (Uses)

(2; highly-mineralized osteogenic sponge compns. for repair of **bone**)

IT **Bone** morphogenetic proteins
RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); DEV (Device component use); PEP (Physical, engineering or chemical process); THU (Therapeutic use); BIOL (Biological study); PROC (Process); USES (Uses)
(7; highly-mineralized osteogenic sponge compns. for repair of **bone**)

IT Proteins, specific or class
RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); DEV (Device component use); PEP (Physical, engineering or chemical process); THU (Therapeutic use); BIOL (Biological study); PROC (Process); USES (Uses)
(LMP (LIM-mineralization proteins); highly-mineralized osteogenic sponge compns. for repair of **bone**)

IT Ceramics
(biocompatible; highly-mineralized osteogenic sponge compns. for repair of **bone**)

IT **Bone** formation
Osteoblast
Osteoclast
Particle size distribution
(highly-mineralized osteogenic sponge compns. for repair of **bone**)

IT **Bone** morphogenetic proteins
Collagens, biological studies
Platelet-derived growth factors
Steroids, biological studies
RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); DEV (Device component use); PEP (Physical, engineering or chemical process); THU (Therapeutic use); BIOL (Biological study); PROC (Process); USES (Uses)
(highly-mineralized osteogenic sponge compns. for repair of **bone**)

IT **Bone**
(implant; highly-mineralized osteogenic sponge compns. for repair of **bone**)

IT Porosity
(microporosity; highly-mineralized osteogenic sponge compns. for repair of **bone**)

IT **Bone** marrow
(osteogenic enhancing factor of; highly-mineralized osteogenic sponge compns. for repair of **bone**)

IT Growth factors, animal
RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); PEP (Physical, engineering or chemical process); THU (Therapeutic use); BIOL (Biological study); PROC (Process); USES (Uses)
(osteogenins; highly-mineralized osteogenic sponge compns. for repair of **bone**)

IT **Bone**
(particles of; highly-mineralized osteogenic sponge compns. for repair of **bone**)

IT Surgery
(spinal fusion; highly-mineralized osteogenic sponge compns. for repair of **bone**)

IT Medical goods
(sponges, osteogenic; highly-mineralized osteogenic sponge compns. for repair of **bone**)

IT Spinal column

(vertebra, fusion of; highly-mineralized osteogenic sponge compns. for repair of **bone**)

IT Transforming growth factors
RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); DEV (Device component use); PEP (Physical, engineering or chemical process); THU (Therapeutic use); BIOL (Biological study); PROC (Process); USES (Uses)
(β-; highly-mineralized osteogenic sponge compns. for repair of **bone**)

IT Microglobulins
RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); DEV (Device component use); PEP (Physical, engineering or chemical process); THU (Therapeutic use); BIOL (Biological study); PROC (Process); USES (Uses)
(β-microglobulins; highly-mineralized osteogenic sponge compns. for repair of **bone**)

IT 10103-46-5, Calcium phosphate
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); THU (Therapeutic use); BIOL (Biological study); PROC (Process); USES (Uses)
(biocompatible ceramics; highly-mineralized osteogenic sponge compns. for repair of **bone**)

IT 61912-98-9, Insulin like growth factor 62031-54-3, Fgf
RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); DEV (Device component use); PEP (Physical, engineering or chemical process); THU (Therapeutic use); BIOL (Biological study); PROC (Process); USES (Uses)
(highly-mineralized osteogenic sponge compns. for repair of **bone**)

REFERENCE COUNT: 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L9 ANSWER 6 OF 7 HCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1999:139773 HCAPLUS
DOCUMENT NUMBER: 130:200953
TITLE: A method of **crosslinking** collagen-based material and bioprosthetic devices produced therefrom
INVENTOR(S): Hendriks, Marc; Verhoeven, Michel; Cahalan, Patrick T.; **Torrianni, Mark W.**; Fouache, Benedicte; Cahalan, Linda
PATENT ASSIGNEE(S): Medtronic, Inc., USA
SOURCE: Eur. Pat. Appl., 26 pp.
CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 897942	A1	19990224	EP 1998-306595	19980818
EP 897942	B1	20040310		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
US 6166184	A	20001226	US 1997-912778	19970818
PRIORITY APPLN. INFO.:			US 1997-912778 A	19970818

AB Methods of **crosslinking** collagen-based material having collagen amine groups and collagen carboxyl groups are provided. The methods comprise blocking at least a portion of the collagen amine groups with a blocking agent to form blocked amine groups; contacting the collagen-based

material having the blocked amine groups with a polyfunctional spacer; and activating at least a portion of the collagen carboxyl groups after blocking at least a portion of the collagen amine groups, wherein the polyfunctional spacer **crosslinks** the collagen-based material and wherein said contacting step may be effected before or after said activating step. Bioprosthetic devices made from these crosslinked collagen-based materials are also provided. **Crosslinking** involving the JEFFAMINE spacers shows the fastest rehydration, whereas glutaraldehyde **crosslinking** tends to be a bit slower. The highly hydrophilic **crosslinked** collagen-derived materials promote infiltration and diffusion of tissue fluid through the material matrix, providing supply of oxygen, nutritive substances, electrolytes and drainage of metabolites. Also, ingrowth of capillary blood vessels and cells is promoted, 25 and consequently the healing response is improved. In addition, hydrophilicity improves the blood compatibility of the material. Collagen samples **crosslinked** according to the method of the invention involving the Jeffamine D230 spacer had a cell growth inhibition of 25%, while cells with a deviant morphol. were not observed

IC ICM C08H001-06
ICS A61L027-00

CC 63-7 (Pharmaceuticals)
Section cross-reference(s): 45

ST **crosslinking** collagen bioprosthetic device manuf

IT Acylation
(agents; **crosslinking** collagen-based material for bioprosthetic devices manufacture)

IT Heart
(aortic valve; **crosslinking** collagen-based material for bioprosthetic devices manufacture)

IT Collagens, biological studies
RL: DEV (Device component use); SPN (Synthetic preparation); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); USES (Uses)
(**crosslinked**; **crosslinking** collagen-based material for bioprosthetic devices manufacture)

IT Biocompatibility
Calcification
Crosslinking
Transplant and Transplantation
(**crosslinking** collagen-based material for bioprosthetic devices manufacture)

IT Aldehydes, reactions
Azides
Ketones, reactions
RL: NUU (Other use, unclassified); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(**crosslinking** collagen-based material for bioprosthetic devices manufacture)

IT Collagens, biological studies
RL: RCT (Reactant); THU (Therapeutic use); BIOL (Biological study); RACT (Reactant or reagent); USES (Uses)
(**crosslinking** collagen-based material for bioprosthetic devices manufacture)

IT 7732-18-5, Water, processes
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(absorption; **crosslinking** collagen-based material for bioprosthetic devices manufacture)

IT 1122-58-3, 4-Dimethylaminopyridine 2592-95-2, N-Hydroxybenzotriazole 6066-82-6, N-Hydroxysuccinimide 39743-84-5

RL: NUU (Other use, unclassified); USES (Uses)
(**crosslinking** collagen-based material for bioprosthetic devices manufacture)

IT 66-25-1, Hexanal 111-30-8, Glutaraldehyde 123-38-6, Propanal, reactions 123-72-8, Butanal 420-04-2, Cyanamide 530-62-1, 1,1'-Carbonyldiimidazole 538-75-0, N,N'-Dicyclohexylcarbodiimide 616-02-4, Citraconic anhydride 693-13-0, N,N'-Diisopropylcarbodiimide 830-03-5, p-Nitrophenyl acetate 1865-01-6, p-Nitrophenyl formate 2466-76-4, 1-Acetylimidazole 2491-17-0 2635-84-9, p-Nitrophenyl butyrate 6066-82-6D, N-Hydroxysuccinimide, esters 9046-10-0, Jeffamine D 230 14464-29-0, N-Hydroxysuccinimidyl acetate 16357-59-8, 2-Ethoxy-1-ethoxycarbonyl-1,2-dihydroquinoline 25952-53-8, 1-Ethyl-3-(3-dimethylaminopropyl)carbodiimide hydrochloride 30364-55-7 74124-79-1, N,N'-Disuccinimidyl carbonate 94820-31-2 152305-87-8
RL: NUU (Other use, unclassified); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(**crosslinking** collagen-based material for bioprosthetic devices manufacture)

IT 74-94-2, Dimethylamine borane 75-22-9, Trimethylamine borane 4856-95-5 16940-66-2, Sodium borohydride 25895-60-7, Sodium cyanoborohydride 65605-36-9
RL: RCT (Reactant); RACT (Reactant or reagent)
(**crosslinking** collagen-based material for bioprosthetic devices manufacture)

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L9 ANSWER 7 OF 7 HCAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 1999:7871 HCAPLUS
DOCUMENT NUMBER: 130:57274
TITLE: **Bone** graft composites and spacers
INVENTOR(S): **McKay, William F.**
PATENT ASSIGNEE(S): SDGI Holdings, Inc., USA
SOURCE: PCT Int. Appl., 56 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9856433	A1	19981217	WO 1998-US11611	19980611
W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				
AU 9878185	A1	19981230	AU 1998-78185	19980611
AU 738218	B2	20010913		
EP 988070	A1	20000329	EP 1998-926323	19980611
EP 988070	B1	20040915		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
JP 2002503992	T2	20020205	JP 1999-502905	19980611
US 6261586	B1	20010717	US 1999-386560	19990831
PRIORITY APPLN. INFO.:			US 1997-873276 A	19970611

WO 1998-US11611 W 19980611

AB A **bone** graft substitute including a composition of natural selectively deactivated **bone** material which has been processed to remove associated non-**collagenous bone** proteins, said **bone** material containing native **collagen** materials and naturally associated **bone** minerals and substantially free from native non-**collagenous** protein, and a therapeutically effective amount to stimulate **bone** growth of a **bone** growth factor in synergistic combination with said **bone** material. Spacers composed of the **bone** graft substitute composition and methods for using the spacers are also provided. A diaphysial cortical **bone** dowel was prepared as well as deactivated allograft and its composite with BMP-2 composite.

IC ICM A61L027-00

CC 63-7 (Pharmaceuticals)

ST **bone** graft composite spacer

IT **Bone** morphogenetic proteins
RL: PEP (Physical, engineering or chemical process); THU (Therapeutic use); BIOL (Biological study); PROC (Process); USES (Uses)
(2; **bone** graft composites and spacers)

IT **Bone**
(artificial; **bone** graft composites and spacers)

IT **Collagens**, biological studies
Proteins, general, biological studies
RL: BOC (Biological occurrence); BSU (Biological study, unclassified); PEP (Physical, engineering or chemical process); THU (Therapeutic use); BIOL (Biological study); OCCU (Occurrence); PROC (Process); USES (Uses)
(**bone** graft composites and spacers)

IT Growth factors, animal
RL: BOC (Biological occurrence); BSU (Biological study, unclassified); PEP (Physical, engineering or chemical process); THU (Therapeutic use); BIOL (Biological study); OCCU (Occurrence); PROC (Process); USES (Uses)
(**bone**-derived; **bone** graft composites and spacers)

IT Transplant and Transplantation
Transplant and Transplantation
(**bone**; **bone** graft composites and spacers)

IT Prosthetic materials and Prosthetics
(composites, implants; **bone** graft composites and spacers)

IT **Bone**
Bone
(transplant; **bone** graft composites and spacers)

IT 1306-06-5, Hydroxyapatite 7758-87-4, Tricalcium phosphate
RL: PEP (Physical, engineering or chemical process); PRP (Properties); THU (Therapeutic use); BIOL (Biological study); PROC (Process); USES (Uses)
(**bone** graft composites and spacers)

REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT